and with the United States Fish Commission, of which he was also President. In 1884 the *Auk* announced that the bird-registers of the United States National Museum had reached 100,000 specimens in number, this splendid collection having been based on the nucleus of 3696 skins, the private collection of Prof. Baird; and the same journal states:—"As being, more than any other living person, entitled to the privilege, specimens numbered 100,000 and 100,001 are entered as donations from Prof. Baird, to whom they were presented by Mr. Geo. N. Lawrence, the oldest active American ornithologist. One of these, a common Crossbill, was shot by Mr. Lawrence, in New York City in 1850, and the other, a Flicker, on Long Island, in 1862."

We may add that, during an experience of twenty years, we have never heard from any ornithologist, European or American, a single unkind word concerning Prof. Baird, either in his public or private capacity. This is something to say in this age of jealousies and backbitings.

R. BOWDLER SHARPE.

NOTES.

LAST year the New South Wales Government, through their Agent-General, invited the British Association to meet at Sydney in January. The invitation has now been withdrawn. Strangely enough, the matter was treated as a party question in the New South Wales Parliament.

THE American Association for the Advancement of Science met in New York from August 10 to 17. Prof. S. P. Langley, the President, in his opening remarks, congratulated the members on the fact that the meeting promised to be most successful. Prof. E. W. Morse, of Salem, Mass., the retiring President, chose as the subject of his address, "What American Zoologists have done for Evolution." "Eleven years ago," said Prof. Morse, "I had the honour of reading before this Association an address in which an attempt was made to show what American zoologists had done for evolution. My reasons for selecting this subject were, first, that no general review of this nature had been made; and, second, that many of the oft-repeated examples in support of the derivative theory were from European sources, and did not carry the weight of equally important facts the records of which were concealed in our own scientific journals. Darwin was pleased to write to me that most of the facts I had mentioned were familiar to him, but, to use his own words, he was amazed at their number and importance when brought together in this manner. The encouragement of his recognition has led me to select a continuation of this theme as a subject for the customary presidential address—a task which is at best a thankless if not a profitless one. Had I faintly realized, however, the increasing number and importance of the contributions made by our students on this subject, I should certainly have chosen a different theme." Prof. Morse laid much stress upon the fact that "American biological science stands as a unit for evolution."

IN Europe the weather rendered almost useless the elaborate preparations which had been made for observations of the total solar eclipse of August 19. From the German stations the Berlin Observatory received a series of dismal telegrams, such as, "Fog and rain; no observations," "Nothing done; quite cloudy," "Cloudy; observed nothing." Partially successful observations were made in Germany only at Nordhausen and Eisleben. In European Russia observers were almost equally unfortunate. At Klin all attempts to get a glimpse of the eclipse were "completely frustrated by the dull gray sky and thick Scotch mist which quickly damped both one's clothes and one's spirits." At the last moment Prof. Mendeleieff, who was stationed at Klin to observe the form of the corona, its spectrum, and the course of the shadow, went up alone in a balloon, but he was too late to obtain important results. A balloon which went up at Tver was met in its ascent by torrents of rain. A glimpse of the sun was obtained at Tver only twice—at the contact, and when it was about seven-eighths obscured. At Spirovs, nearer St. Petersburg, totality is said to have been visible for twenty seconds. At Petroffsk, in the Government of Jaroslav, Prof. Glasenapp, of St. Petersburg, was lucky enough to be able to make six drawings and to get two photographs, while Prof. Stanoievitsch, of Belgrade, was successful in observing and photographing the spectrum of the corona. Fortunately there was a clear sky at Tomsk and other stations in Siberia.

IT is worth noting that an extraordinary amount of interest was excited on the Continent by the eclipse. It is calculated that in Berlin and the neighbourhood no fewer than 200,000 persons were waiting in the hope of seeing it, and in Russia great numbers of people flocked to many points of observation. This may, we hope, be taken as an indication that both in Russia and Germany there is a growing popular appreciation of some of the more striking truths of physical science.

THE Berlin Correspondent of the *Times* has brought together some interesting reports as to the effect of the eclipse upon the lower animals. Foresters state that the birds, which had already begun to sing before the eclipse took place, became of a sudden quite silent, and showed signs of disquiet when darkness set in. Herds of deer ran about in alarm, as did the small four-footed game. In Berlin a scientific man arranged for observations to be made by bird-dealers of the conduct of their feathered stock, and the results are found to deviate considerably. In some cases the birds showed sudden sleepiness, even though they had sung before the eclipse took place. In other cases great uneasiness and fright were observed. It is noticeable that parrots showed far more susceptibility than canaries, becoming totally silent during the eclipse, and only returning very slowly to their usual state.

IT is greatly to be regretted that the Government has found it necessary to abandon the Technical Education Bill. In announcing to the House of Commons the surrender of the measure, Mr. W. H. Smith said:—"We hoped that the Bill would have been received almost unanimously by the House, but it has met with opposition, and we are threatened with prolonged discussion of the measure, and on August 18 I cannot encounter the difficulties which are likely to be thrown in the way if we persist in the carrying through of that Bill in the course of the present session. It is, however, a measure which we should feel it our duty to introduce in the very earliest days of the next session, and I hope that the consideration which will be given to the subject in the interval will enable us to meet any objections raised by hon. friends on this side of the House, and by hon. gentlemen on the other side, so as to produce a measure which will rapidly obtain the concurrence of the House without exciting any party feeling of any kind whatever, for I should greatly deprecate any party or sectional feeling in a question of this kind."

IN the discussion on Tuesday evening of the vote to complete the sum of £147,385 for the British Museum, Sir J. Lubbock expressed much regret that the amount allotted to purchases for the Museum was £10,000 less than usual. It would be hard to conceive a more striking instance of misplaced economy, for, as Sir J. Lubbock pointed out, there is at the present moment an exceptional number of interesting specimens for sale. Mr. Molloy proposed that the Museum should be opened at night, and maintained that the sum required for the electric light would not exceed £1000 per annum. Mr. W. H. Smith, on behalf of the Government, promised that this question should be most carefully examined during the recess.

ON Tuesday evening, in connexion with the vote to complete the sum of £23,900 for learned Societies, &c., several Scottish members complained that science in Scotland receives anything but generous treatment. Sir John Lubbock was able to show that in some of their statements they did not take all the facts into account; but the demands made on behalf of the Ben Nevis Observatory were certainly not unreasonable. If a grant cannot be made to this institution, the Government might at least give up its claim to the sum of £130 paid annually to the Post Office for the use of the telegraph.

MESSRS. MACMILLAN will publish shortly a work on the nervous system and the mind, by Dr. Charles Mercier. It is intended to serve as an introduction to the scientific study of insanity. It will contain an exposition of the new neurology as founded by Herbert Spencer and developed by Hughlings Jackson; an account of the constitution of mind from the evolutionary standpoint, showing the ways in which it is liable to be disordered; and a statement of the connexion between nervous function and mental processes as thus regarded.

DR. ALFRED R. WALLACE arrived at Liverpool on Saturday last by the steamship *Vancouver* from Quebec, after his ten months' lecture tour in the United States and Canada. He saw a good deal of the country, and spent two months in California and the Rocky Mountains. During his stay at Boston and Washington he made the acquaintance of most of the American men of science.

A LETTER on Antarctic exploration has been addressed by Capt. C. Pasco, R.N., to Admiral Sir E. Ommanney, Hon. Secretary to the Antarctic Committee of the Geographical Section of the British Association. Capt. Pasco writes on behalf of the Antarctic Committee appointed by the Royal Society of Victoria and the Victorian branch of the Royal Geographical Society of Australasia. Much of the information contained in the letter has already appeared in NATURE (June 30, p. 211, and July 21, p. 277). Having dealt with the question of ways and means, Capt. Pasco says the Victorian Societies feel warranted in recommending the renewal of Antarctic research for the following reasons: (1) that the configuration of the Antarctic continent may be traced further, with the view to extend our acquaintance with the geography of the globe; (2) that a further insight into the geology of these lands may be obtained; (3) that it is desirable to increase the extent of the determined physiography of the world by ascertaining whether the recent volcanic disturbances in New Zealand and in the Sunda Islands—both situated on the line of weak earth crust which is believed to carry the volcanoes of Victoria Land—have produced changes of any kind in the Antarctic Circle; (4) the examination of Mount Erebus would appear to be practicable, as Ross reports that the coast became lower as it trended towards its foot, and the results of a visit to the locality should be of the highest interest; (5) that the question whether any secular climatic change is in progress may be investigated, and that the sea temperatures may be ascertained by means of the most modern appliances; (6) that the magnetic survey of these parts may be resumed, and that new data may be obtained for comparison with the elements recorded by Ross; (7) that the existence of whales or seals, or the occurrence of any commercial products, may be accurately observed. In concluding his letter, Capt. Pasco expresses a hope that the efforts of the British Association in favour of the renewal of Antarctic exploration may speedily receive the reward which they deserve. "We sincerely trust," he says, "the exploratory work in the Antarctic, commenced so well by the illustrious Cook, and continued by other brave seamen, but stayed ever since the return of that successful explorer and navigator Ross, may be resumed at once with energy, intelligence, and ample appliances."

THE *Jahrbuch* of the Norwegian Meteorological Institute for 1885 (the last published) shows the part which is taken by Norway in the general system of meteorological organizations. The work contains complete observations for twelve stations, and summaries for sixty-eight others, among which are seven lighthouse stations; for the latter the observations of sea-temperature are also published. Systematic observations were begun in Christiania as early as 1837 by the professors of the University, and were regularly published until the end of 1867. In the meantime (1860) the Director of the Christiania Observatory had commenced the publication of the observations taken at five telegraphic stations on the coast, in addition to those of the Observatory, and this series was continued until the end of 1886, at which time the Meteorological Institute was established under the present Director, Prof. H. Mohn, so that the present year-book forms really the nineteenth of the series. With the year 1874 the work took its present shape, in order to bring it more into conformity with the decisions of the Meteorological Congress at Vienna (1873); yet we observe that the wind-force is estimated according to the old land-scale 0–6, which is now seldom used, while in this country the scale is 0–12, and in other countries more usually 0–10. This diversity of scales leads to great confusion when dealing with wind-observations generally. The Institute publishes somewhat less than several other countries, but its staff is doing good work in connexion with the Reports of the Norwegian North Atlantic Expedition of 1876–78, and the Polar Expedition of 1882–83.

THE Imperial Academy of Sciences of St. Petersburg has issued a new edition of its "Instructions for use at Meteorological Stations" (St. Petersburg, 1887, 106 pp. 8vo, and 34 woodcuts) by Dr. H. Wild, Director of the Central Physical Observatory. The first edition appeared in 1869, since which time the number of meteorological stations of the second order in Russia has increased from 33 to 255. The work is written in the German language and is divided into three parts: (1) directions for the erection of the instruments and for taking the observations, (2) a description of the instruments used at the stations of the Russian system, and (3) a description of the instruments required for observations not always taken at ordinary stations. But the work is not accompanied by the tables generally annexed to such instructions. Siphon barometers are mostly employed in Russia, but latterly portable cistern barometers have been adopted for use at distant stations. Several of the instruments, all of which are clearly illustrated, are not in use in this country. Among them may be specially mentioned:—(1) A portable equatorial sun-dial on Fléchet's principle for places where no good time-piece is available, showing the mean time within five minutes. (2) A swinging-plate wind-gauge, which was generally in use in Switzerland while Dr. Wild was at Berne, and now is adopted in Russia. This instrument is described in the Report of the Meteorological Congress held at Vienna in 1873; it consists of a rectangular metal plate suspended like a sign-board, and shows the force of the wind by its displacement from the vertical position. (3) A rain-gauge on Prof. Nipher's principle, with arrangements for protection against the influence of high winds on the rainfall. (4) A nephoscope invented by Dr. Fineman, of Upsala, a model of which was exhibited at the meeting of the International Meteorological Committee at Paris in 1885. In the *Meteorologische Zeitschrift* for August, Dr. Köppen points out a discrepancy in the description of the somewhat rare phenomenon of glazed frost; but, as a whole, the treatise will rank as one of the best extant.

THE Report of the Meteorological Reporter for the Punjab for the financial year 1886–87 states that the most important feature in the meteorology during the year has been the failure of the cold weather rains (December to March). In January there was a certain amount of excess in the Delhi division, but in all other parts of the province there was a deficiency, and the following months were practically rainless. The monsoon rains (June to September) were generally good, notwithstanding their early cessation. The Report of the Sanitary Administration for the calendar year 1886, which has arrived simultaneously with that above mentioned, shows that the greatest annual rainfall was 53·3 inches at Abbottabad (Peshawar), and the least 4·3 inches at Muzaffargarh (Deraját). We omit the exceptional amount of 127·5 inches at Dharmsála (Jullundur). The inclusion of this excessive amount vitiates the general mean for the stations for the year, viz. 29·1 inches, which is more than three inches higher than it would be if this exceptional amount were omitted from it. The Meteorological Reporter gives 183° as the highest temperature in the sun's rays, being at Lahore on April 28, and it ranged from 172° to 175° in the five succeeding months. The maximum reading in the shade was 118° at two stations on the 13th, and the lowest maximum was 79° at Sirsa (Delhi), in January. The absolute minimum in the shade was 29° at Ráwalpindi, in February, giving a range of 89° in the shade temperature for the whole province. During the early part of this month of February a remarkable wave of low temperature passed over the Punjab; on the 9th and 10th remarkably low temperatures were recorded.

THE results of a long series of experiments upon the nature of the chemical action between acids and the metal zinc have just been published by MM. Spring and van Aubel in the August number of the *Annales de Chimie et Physique*. Although one of the first chemical reactions which come under the notice of students, it has hitherto been among the least understood. The method of experiment was to plunge a quantity of zinc, which contained a small quantity of lead, and whose surface was known, into such a volume of the acid of known strength as would suffice for the elimination of a volume of hydrogen = Q. The hydrogen was collected in a vessel divided into aliquot parts, q, of Q; with the aid of a chronograph the times t_1, t_2, &c., necessary for the production of successive volumes $= q$ were noted, and from the data obtained the rapidity of the reaction $\frac{q}{t_1}$, $\frac{q}{t_2}$, &c., at corresponding epochs was estimated, thus following the reaction step by step from beginning to end. The results were eventually represented graphically, the abscissæ representing successive quantities q, and the ordinates the rapidity. The action of the acid upon the zinc is not most rapid at the origin, but increases to a maximum when the acid is about half its original strength, afterwards diminishing proportionally to the concentration to the end of the reaction, so that the curve after passing the maximum becomes a straight line. The early stage previous to attaining the maximum is called the *mise en train* of the reaction, or period of induction, and it is conclusively shown that during this period the acid, by a slow action, prepares at the surface of the metal an infinity of little electric couples by exposing the minute grains of lead contained in the zinc. Hence, De la Rive's idea that the solution of a metal by an acid is mainly due to electrolytic action is substantially correct. It will be remembered that De la Rive showed that pure zinc is only attacked by acids with extreme slowness, but that if traces of copper, iron, or lead be present the evolution of hydrogen is much more rapid. One most interesting result emerges from the experiments of Spring and van Aubel: the curves from all the experiments with hydrochloric acid intersect about $-70°$ C., showing that at this temperature no action at all occurs between this acid, however concentrated, and zinc, and it is a known fact that zinc does not dissolve in liquefied hydrochloric acid gas, whose temperature of liquefaction is near $-70°$. Sulphuric acid acts upon zinc twenty-seven times more feebly than hydrochloric, and the electrolytic action appears to be the vastly preponderating one, the sulphate of zinc resulting from the action of H_2SO_4 upon the ZnO first formed by electrolysis; hence the true nature of this every-day reaction is probably as follows: $Zn + H_2SO_4 = ZnO + H_2 + SO_3$; $SO_3 + H_2O + Aq = H_2SO_4 + Aq$; $H_2SO_4 + ZnO = ZnSO_4 + H_2O$.

RUSSIAN geological literature has been enriched during the current year by a most valuable publication, which will be especially welcome to West European geologists. We mean the "Bibliothèque geologique de la Russie," published in Russian and in French by the Geological Committee, under the editorship of M. Nikitin. The first volume contains an index, as nearly complete as possible, of books, pamphlets, and articles published in Russia on geology, mineralogy, and palæontology during the year 1885. During the last few years geology has made rapid progress in Russia, and although all the chief works produced recently have been published either in the *Izvestia* or *Trudy* of the Geological Committee, or in the *Zapiski* of the Mineralogical Society, a great number of important papers are scattered in the Memoirs of the Academy and other scientific bodies, and thus often escape the attention even of Russian geologists. To West European geologists most of these papers have hitherto remained quite unknown. The "Bibliothèque géologique" mentions all of them, and gives short analyses, which sum up in Russian and French all the chief facts mentioned, and the conclusions arrived at, in the works and papers enumerated. The analyses are generally admirable, and most of them are due to the pen of Miss Mary Tswetaev.

M. MAINOFF'S work on the "Juridical Customs of the Mordovians," published in the fourteenth volume of the Memoirs of the Russian Geographical Society for Ethnography, is a capital inquiry into the customs of this important branch of the Volga Finns, as they have shaped themselves under the double influence of the Russians and the Tatars. It is an important addition to the work by the same author which contained his anthropological measurements. M. Mainoff has devoted attention chiefly to marriage customs, but his work, which is the result of many years' acquaintance with the Mordovians, contains plenty of useful information on other subjects. It is worthy of notice that until quite recent times the Mordovians knew no such word as "relations" (French, *parents*), and that they used only the word *tev*, or *tevx*, which corresponds to the *gens* as explained by Mr. Lewis Morgan. Only those were considered as kinsfolk who had a common descent, and lived under a common roof. The compound family continues to exist among the Mordovians, but on a very limited scale. The remarks of M. Mainoff on the kidnapping of brides are very interesting. This form of marriage still survives among the Mordovians, but it takes place with the consent of the bride, and very often with the knowledge of her parents.

MR. HOWARD GRUBB, telescope-maker, was one of a group of gentlemen on whom the Lord Lieutenant of Ireland conferred the honour of knighthood on Monday last.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus rhesus*) from India, presented by Mr. Thos. D. Wickenden; a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mr. Charles Crocker; four Black-eared Marmosets (*Hapale penicillata*) from South-East Brazil, presented respectively, two each, by Mr. George Best and Mr. J. Crick; a Purple-faced Monkey (*Semnopithecus leucoprymnus*) from Ceylon, presented by Mr. H. Hart; a Ruffed Lemur (*Lemur varius* ♀) from Madagascar, presented by Mrs. M. Kestell-Cornish; a Moustache Monkey (*Cercopithecus cephus*), two Lesser White-nosed Monkeys (*Cercopithecus petaurista*), two White-crowned Mangabeys (*Cercocebus æthiops*), an African Civet Cat (*Viverra civetta*), a Blotched Genet (*Genetta tigrina*), a Two-spotted Paradoxure (*Nandinia binotata*), a White-crested Tiger-Bittern (*Tigrisoma* *leucolophum*), a Madagascar Porphyrio (*Porphyrio madagascariensis*), five Tambourine Pigeons (*Tympanistria bicolor*), three Schlegel's Doves (*Chalcopelia puella*) from West Africa, presented by Mr. J. B. Elliott; a Common Cormorant (*Phalacrocorax carbo*), European, presented by Mr. T. M. Oldham; a Great Eagle Owl (*Bubo maximus*), European, a Virginian Eagle Owl (*Bubo virginianus*) from North America, presented by Mr. Charles Clifton; a Hygian Snake (*Elaps hygiæ*) from Port Elizabeth, presented by Mr. W. K. Sibley; a Tarantula Spider (*Mygale*), from Bahama, presented by Mrs. Blake; a Sand Lizard (*Lacerta agilis*) from Jersey, presented by Mr. F. T. Mason; a Prince Albert's Curassow (*Crax alberti*) from Columbia, a Slender-billed Cockatoo (*Licmetis tenuirostris*) from South Australia, deposited; three Oyster-catchers (*Hæmatopus ostralegus*), European, purchased; a Blood-breasted Pigeon (*Phlogœnas cruentata*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

MAGNITUDES OF "NAUTICAL ALMANAC" STARS.—In order to expedite the publication of short articles upon astronomical and meteorological subjects, prepared at the Harvard College Observatory, Prof. Pickering has decided to print each as completed as successive numbers of a series, which, when a sufficient amount of material has been collected, will constitute the eighteenth volume of the Annals of the Observatory. Each number is to be published and distributed soon after it is prepared.

The first of this series of papers is a collection the stars employed in the standard lists of the *Nautical Almanacs* published by the Governments of Great Britain, the United States, France, Germany, and Spain, together with their magnitudes, as derived from four standard authorities: the *Harvard Photometry*, the *Uranometria Argentina*, Wolff's photometric observations, and the *Uranometria Oxoniensis*, the second and third being reduced to the photometric scale employed in the other two catalogues, the Harvard and Oxford scales agreeing closely. At present the magnitudes assigned to these stars in the respective Almanacs do not agree, nor do they represent the most accurate results available. Prof. Pickering therefore offered to the Superintendents of the Almanac Offices to supply a discussion of the best values of the magnitudes at present attainable; and favourable replies having been obtained in the cases of the French, Spanish, and American Almanacs, it is expected that the improved values here given will be used in those works in future.

The list embraces 800 stars, and of these the magnitudes of all but 64 depend at least upon two, and generally upon three, authorities; 132 stars being common to all four of the adopted standard catalogues of brightness. The average values of the residuals from the adopted means for these 132 stars are respectively: Harvard, 0·062; Argentine, 0·093; Wolff, 0·094; Oxford, 0·106. The average probable error of the adopted magnitudes is 0·09, assuming the absence of systematic error. The total number of residuals is 2188, of which only 67 exceed two-tenths of a magnitude, and only 17 three-tenths. There are only two cases of a residual exceeding four-tenths, both in the Oxford *Uranometria*; the one being the low star θ Ophiuchi, the other the double star θ Serpentis.

COMET 1887 *e* (BARNARD, MAY 12).—The following ephemeris for Berlin midnight is given by Dr. H. Kreutz (*Astr. Nachr.*, No. 2799). The comet is very favourably placed for observation, but is extremely faint.

1887	R.A. h. m. s.	Decl. ° ′	log *r*	log Δ
Aug. 24	18 41 48	7 40·8 N.	0·2320	9·9641
,, 28	18 49 6	7 16·5	0·2402	9·9868
Sept. 1	18 56 22	6 51·3	0·2484	0·0093
,, 5	19 3 34	6 25·7 N.	0·2567	0·0315

ASTRONOMICAL PHENOMENA FOR THE WEEK 1887 *AUGUST* 28—*SEPTEMBER* 3.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on August 28

Sun rises, 5h. 7m.; souths, 12h. 1m. 8·9s.; sets, 18h. 55m.; decl. on meridian, 9° 45′ N.: Sidereal Time at Sunset, 17h. 22m.

Moon (Full on September 2, 11h.) rises, 16h. 6m.; souths, 20h. 25m.; sets, 0h. 45m.*; decl. on meridian, 19° 44′ S.

Planet.	Rises. h. m.	Souths. h. m.	Sets. h. m.	Decl. on meridian. ° ′
Mercury	3 50	11 15	18 40	15 26 N.
Venus	8 25	13 47	19 9	8 6 S.
Mars	1 48	9 48	17 48	20 57 N.
Jupiter	10 28	15 34	20 40	11 10 S.
Saturn	1 54	9 48	17 42	20 6 N.

* Indicates that the setting is that of the following morning.

Occultations of Stars by the Moon (visible at Greenwich).

August.	Star.	Mag.	Disap. h. m.	Reap. h. m.	Corresponding angles from vertex to right for inverted image. ° °
28	ξ′ Sagittarii	6	18 54	19 56	36 304
Sept.					
1	45 Capricorni	6	0 15	1 29	108 330
1	44 Capricorni	6	0 33	near approach	216 —
2	χ Aquarii	5½	23 7	near approach	190 —

August.	h.	
28	17	Mars in conjunction with and 0° 49′ north of Saturn.
29	11	Venus stationary.

Variable Stars.

Star.	R.A. h. m.	Decl. ° ′		h. m.	
U Monocerotis	7 25·6	9 33 S.	Aug. 31,		*m*
W Virginis	13 20·2	2 48 S.	,, 31,	23 0	*M*
δ Libræ	14 54·9	8 4 S.	,, 29,	4 57	*m*
			Sept. 2,	20 40	*m*
U Coronæ	15 13·6	32 4 N.	Aug. 29,	20 18	*m*
S Libræ	15 14·9	19 59 S.	Sept. 2,		*M*
U Ophiuchi	17 10·8	1 20 N.	Aug. 31,	4 46	*m*
			and at intervals of	20 8	
X Sagittarii	17 40·5	27 47 S.	Aug. 31,	22 0	*m*
W Sagittarii	17 57·8	29 35 S.	,, 28,	0 0	*M*
R Scuti	18 41·5	5 50 S.	,, 28,		*m*
R Lyræ	18 51·9	43 48 N.	,, 31,		*M*
S Vulpeculæ	19 43·8	27 0 S.	Sept. 2,		*m*
χ Cygni	19 46·2	32 38 N.	Aug. 29,		*m*
S Sagittæ	19 50·9	16 20 N.	,, 31,	0 0	*m*

M signifies maximum; *m* minimum.

THE FACTORS OF ORGANIC EVOLUTION.

WHILE reviewing, a short time ago, Mr. Herbert Spencer's essay on the above subject (NATURE, vol. xxxv. p. 262), I promised to consider the present standing of the question as to whether, or how far, use and disuse admit of being regarded as true causes of change of organic type. Of course there is no question about the effects of use and disuse as regards the individual: the only question is as to whether, or how far, these effects admit of being inherited, so that modifications of structure which are produced by modifications of function in the individual become causes of corresponding, and therefore of adaptive, changes of structure in species. The importance of this question is second to none in the whole range of biology. For not only is it of the highest importance within the range of biology itself—governing, by whatever answer we give it, our estimate of the importance of natural selection, and thus requiring to be dealt with on the very threshold of biological philosophy—but its influence extends to almost every department of thought. For, as Mr. Spencer remarks in his preface, upon the answer which this question may finally receive will depend in chief part the sciences of psychology, ethics, and sociology. If functionally-produced modifications are inheritable, the phenomena of instinct, innate ideas, moral intuitions, and so forth, admit of a scientific explanation at the present moment; otherwise they do not, or, at least, not in so distinct nor in so complete a manner. Therefore, we can hardly feel that Mr. Spencer exaggerates the importance of this question when he says of it, "Considering the width and depth of the effects which our acceptance of one or other of these hypotheses [namely, that functionally-produced